

Checkout and Launch Control System (CLCS)

Juno System Test Report

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1.0 Scope

This document serves as the final record of the CLCS Juno System Test, the test results and the lessons learned during the test effort.

1.1 Identification

This document is the Checkout and Launch Control System (CLCS) System Test Report, Rev. BASIC. This document will be maintained under the control of the CLCS configuration management program.

1.2 Purpose

The purpose of this document is to describe the work performed in preparation for the CLCS Juno System Test, the state of the system at the start of the System Test, the execution and results of the System Test and the lessons learned during the system test process. This report is the final input to the Delivery Acceptance Review in which CLCS deliveries are formally completed.

1.3 Document Organization

This document is divided into four sections and three appendices:

Section 1, Scope, discusses the identification, purpose and organization of the CLCS System Test Report.

Section 2, Applicable Documentation, lists the documents used to create and support this document.

Section 3, System Test Report, contains a detailed description of the CLCS Juno System Test and its results.

Section 4, Lessons Learned, lists items that should be taken into account in future system tests to ensure that the CLCS delivery process is efficient and complete.

Appendix A, Acronyms and Definitions, contains a listing of acronyms and selected word definitions (for words that may have multiple interpretations).

Appendix B, CLCS System Test Procedures (as run), contains a copy of the test procedures as executed, including test notes, outputs and signatures.

Appendix C, Problem Reports, contains a copy of all problem reports opened prior to and during System Testing.

2.0 Applicable Documentation

The following documents, of the revision shown, form a part of this document to the extent specified.

2.1 Parent Documents

The documents in this paragraph establish the criteria and technical basis for the existence of this document. The parent documents are:

Parent Document	Document Number	Rev.	Date
CLCS System Test Plan	N/A ¹	BASIC	3/27/97
CLCS Program Management Plan	N/P ²	-	-
CLCS System Engineering Management Plan (SEMP)	N/P	-	-
CLCS Project Plan	N/P	-	-

Table 2.1: Parent Documents

2.2 Reference Documents

Reference documents are those documents which, though not a part of this document, serve to clarify the intent and contents of this document.

Reference Document	Document Number	Rev.	Date
CLCS System Level Specification	N/P	-	-
CLCS CM Plan	N/P	-	-
CLCS Integration Management Plan	N/P	-	-
CLCS Certification Plan	N/P	-	-
CLCS System Design Document	N/P	-	-
CLCS Software Development Plan	N/P	-	-
CLCS Concept of Operation	N/P	-	-

Table 2.2: Reference Documents

¹ N/A indicates document number is not available. The configuration management process for CLCS program documents has not been finalized, however this document is considered baselined.

² N/P indicates that the document has not yet been published. References are included in these tables to show current expectations.

3.0 Test Report

3.1 Test Summary

The Juno System Test was intended to evaluate the baselined CLCS integration and test process. Because the CLCS System Level Specification document has not been baselined, no requirements “buy-off” was possible. Quality Assurance did not formally witness and approve the test, though informal support was provided. The test procedures were written in the standard system test format and went to the appropriate level of detail for the items tested. The software delivered with Juno can not be considered to be completely system tested because there were features, capabilities and programs that were not included in the Juno System Test. Any software or hardware developed for Juno that is to be included in Redstone or later deliveries will go through formal system testing at that time.

System Integration in Satellite Development Environment 1 (SDE1) in the EDL facility was completed on April 14th 1997. System Testing began on April 14th with the execution and completion of test cases 3.1 and 3.4. Test case 3.2 was executed and completed on April 16th and test case 3.3 was executed and completed on April 22nd. Three Issue Reports (referred to in previous documents as Problem Reports) were generated during the system test, two major and one minor. No critical Issue Reports were generated. The Juno System Test has been successfully completed.

3.1.1 Summary of Dry Run Testing and Test Set-Up

Dry runs of the test procedures were performed prior to the execution of the test case that they supported, there was no end-to-end dry run. This was not a problem given the intent of the Juno System Test. It was required due to platform availability issues (development work and demonstrations in the LCC-X) and system integration activities occurring concurrently on other parts of the system.

No problems were found during test set-up (other than those associated with correcting the preliminary test procedures). Test user accounts and test files were generated without difficulty.

3.1.2 System Configuration

The hardware configuration used during the Juno System Test for the gateways in the LCC is shown in Figure 1. The hardware configuration used during the Juno System Test in the SDE1 is shown in Figure 2. Table 1 shows the operating system versions used in this configuration.

LCC Gateway Block Diagram

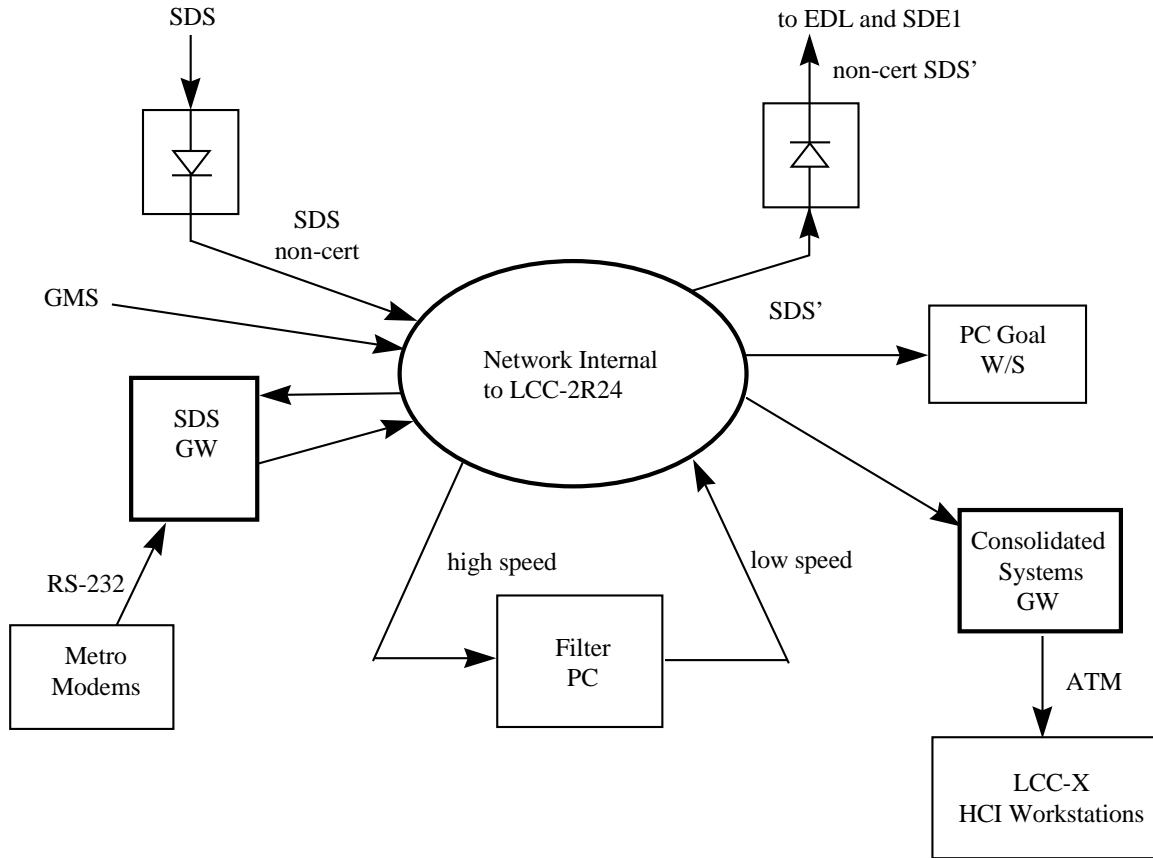


Figure 1: CLCS Gateway Configuration in LCC room 2R24

Software	Vendor	Version	Platform	Facility
IRIX (UNIX operating system)	Silicon Graphics Incorporated (SGI)	6.2	SGI Indigo 2, SGI Indy, SGI Challenge	SDE, LCC-X
IRIX (UNIX operating system)	Silicon Graphics Incorporated (SGI)	6.3	SGI O2	SDE, LCC-X
VxWorks (Gateway OS)	VxWorks	5.2	SDS Gateway, CS Gateways	SDE, LCC-X

Table 1: Operating System Versions by Platform

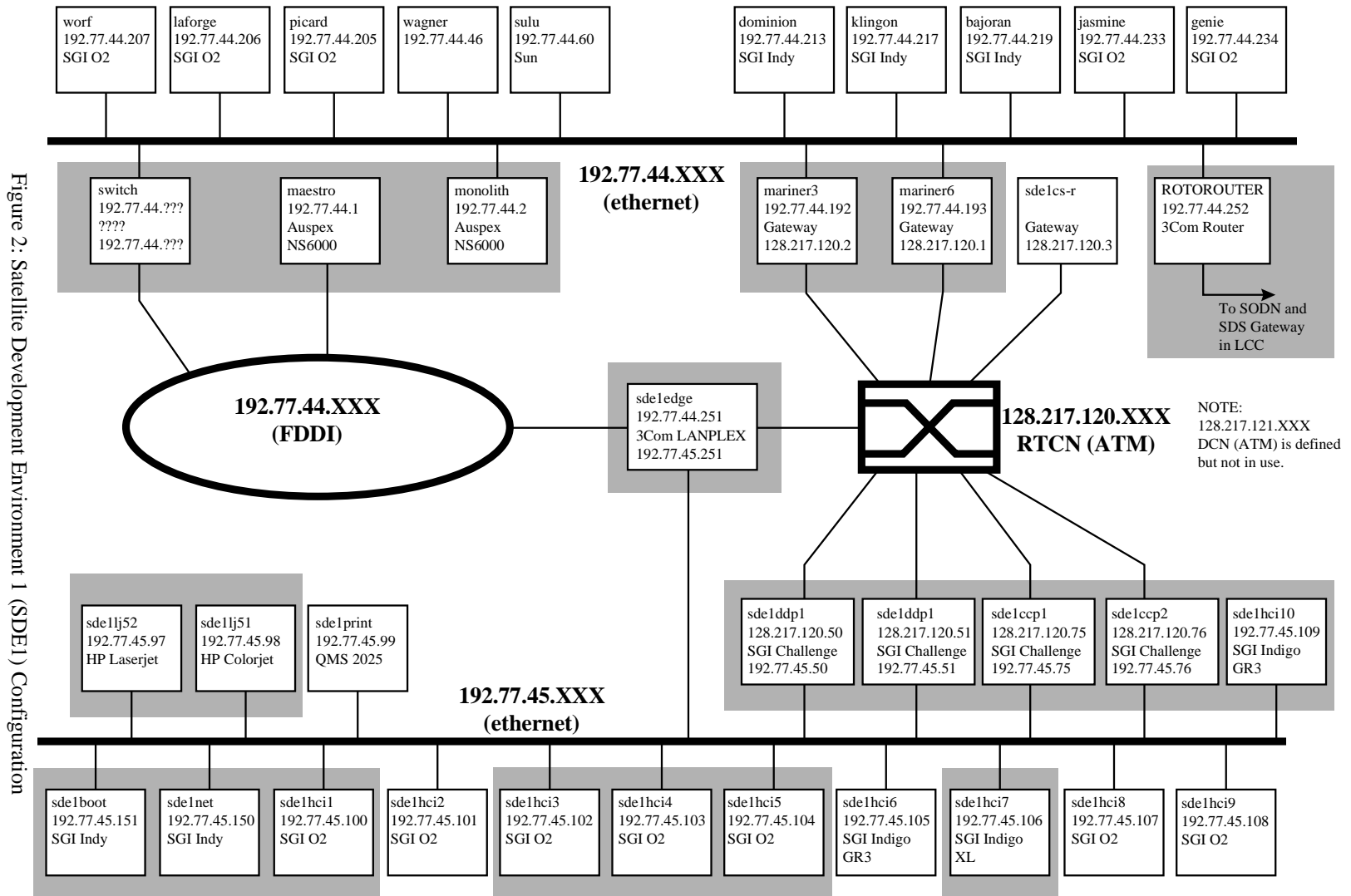


Figure 2: Satellite Development Environment - SDE1
(Shaded areas indicate equipment required for System Test)

3.1.3 Known Problems

Problems that were known prior to the start of System Test are listed in Table 2. Table 3 lists problems discovered after the start of system testing. See Appendix C for the complete text of the Issue Reports.

Number	Title	Criticality	Date Opened	Current Status
Juno-1	POS_LOGIN: PSS environment variables not available in mwm xterms	Major	4/10/97	In Work
Juno-2	Event Services: LDS Status/Control not available on remote workstations	Major	4/10/97	In Work
Juno-3	Timing Services: Core dump on Modify Timer	Major	4/10/97	In Work
Juno-4	Timing Services: Cannot copy an existing timer	Major	4/10/97	In Work
Juno-5	Autopilot: Deconfigure doesn't work on logout	Major	4/10/97	In Work
Juno-6	Log/Delog: Font problem after application ID is added	Minor	4/10/97	In Work
Juno-7	Printer Services: Cannot print man pages	Major	4/10/97	In Work
Juno-8	Cannot run Configuration Management Shell application	Major	4/10/97	Closed
Juno-9	Positional .xsession sourced on login	Minor	4/10/97	Closed
Juno-10	DDP router process requires ROOT access	Major	4/10/97	Closed

Table 2: Known Problems at Start of System Test

Number	Title	Opened During	Criticality	Date Opened	Current Status
Juno-11	Telnet from sde1hci1 to sde1ddp-r failed	System Test	Major	4/14/97	Open
Juno-12	Remote delog written into wrong directory	System Integration	Major	4/15/97	Open
Juno-13	Application displays CPU intensive	System Integration	Minor	4/15/97	Open
Juno-14	Telnet to SDS Gateway not working	System Test	Minor	4/22/97	Open
Juno-15	Error received when attempting to start receive process	System Test	Major	4/22/97	Open

Table 3: Problems Discovered after Start of System Test

3.2 Execution of Juno Test Case 3.1

The purpose of this test case was to demonstrate that the process for compiling, and installing/distributing software is correct and consistent at the system level, as is the process for baseline control. These capabilities were developed in conjunction with the Juno Development Environment Foundation thread.

In this test, a short segment of code was developed and build procedures were used to take developed source code through to an operational configuration. The code was submitted to the software configuration management system, checked back out, modified and resubmitted.

This test case was successfully completed in the SDE1 with no anomalies. No changes to the approved procedures were required.

3.3 Execution of Juno Test Case 3.2

The purpose of this test case was to demonstrate the process for taking the system from a powered off and/or quiescent state to a state in which data is flowing (end user ready to work). These capabilities were developed in conjunction with the Juno Development Environment Foundation, the Development Environment System Software, the Consolidated SDS, the Consolidated Data and the Reliable Messaging threads. This test followed a typical ops scenario for bringing the system up.

This test case was successfully completed in the SDE1. The approved procedures for this test case were replaced (at the start of execution of this test case) in their entirety with corrected and more detailed procedures. One anomaly was observed during test case

execution. The first attempt to display data failed. Step six of the amended procedures contained an error, calling for the selection of data stream number 11 when it should have been 20. The procedure was redlined and the test completed successfully. No Issue Report was generated and no other significant changes to the amended procedures was required.

3.4 Execution of Juno Test Case 3.3

The purpose of this test case was to demonstrate the flow of consolidated data into the Consolidated SDS gateway, through the system to the end user display in the LCC-X environment. These capabilities were developed in conjunction with the Juno Consolidated SDS thread.

This test case was successfully completed in the LCC-X environment. The approved procedures for this test case were replaced (at the start of execution of this test case) in their entirety with corrected and more detailed procedures. Three anomalies were observed and two Issue Reports were generated.

The first anomaly occurred in step 19. The error “Can’t find shared memory segment with key value 2000...” was received. The error did not impact the test and was received due to the power off and reboot of the workstation in prior steps. No Issue Report was generated.

The second anomaly occurred in step 29. Keyboard input was not accepted. A second xterm window was opened and a successful telnet session to the gateway was established and cleanly ended. “Juno-14: Telnet to SDS Gateway not working” was opened as a Minor Issue Report . The test case was successfully completed.

The third anomaly occurred while attempting to execute the test case a second time (on behalf of a S&MA representative). On step 21, the error “clm_open(rcv_sock): Open of IP Multicast failed.” was received. This error is indicative of data from the CS gateway not reaching the HCI workstation. Problem investigation was not possible at the time, though a procedural error during the gateway start up was suspected. “Juno-15: Error received when attempting to start receive process” was opened as a Major Issue Report.

3.5 Execution of Juno Test Case 3.4

The purpose of this test case was to demonstrate a subset of basic system services required for operating the CLCS, specifically some of the COTS services required for operating a distributed UNIX based system. This included network tools, printing, and file access control. These capabilities were developed in conjunction with the Juno Development Environment Foundation thread. This was not intended to be a thorough checkout of all CLCS COTS software.

This test case was successfully completed in the SDE1. Two anomalies were observed and one Issue Report was generated. This first anomaly occurred in step 11. The telnet from a workstation on the ethernet (sde1hci1) to the ATM interface on a DDP (sde1ddp1-r) failed. This prevented further testing of the ethernet to ATM interface. "Juno-11: Telnet from sde1hci1 to sde1ddp-r failed" was opened as a Major Issue Report. The second anomaly occurred in step 39. When changing the current user ID, the error "Could not determine current working directory" was received. Subsequent attempts did not receive the problem and the problem could not be duplicated. No Issue Report was generated.

4.0 Lessons Learned

This section lists items, events or conditions that were noted prior to and during the System Test which identify opportunities for improvement in the CLCS development and delivery process.

4.1 General

- 1) The configuration management process was not complete, multiple baselines of some software components existed.
- 2) System Integration and System Test dry runs can, in most cases, be performed in parallel provided that System Integration leads test dry runs by enough time to allow for system builds and the integration of at least one complete capability that is to be tested.
- 3) A CLCS software sustaining process needs to be defined and implemented as soon as possible to allow for:
 - The identification of responsible engineers to handle problem investigation, resolution and functional (CSCI) level re-testing prior to and after a system delivery.
 - Methods for including urgent problem fixes in the current delivery (updating the delivery baseline after start of system test) verses waiting for subsequent deliveries.
 - Better assurance that problems discovered during integration and testing are routed to the appropriate developer in an efficient manner.
- 4) Requirements buy-off process needs to be refined.
 - Quality Assurance requirements on this process must be clarified.
 - Traceability is required for functional requirements to: CSCI's, HWCI's, CSCI tests and test cases, System Level Specification requirements.
- 5) Hardware identification could be improved. Most workstations were sufficiently labeled, some were not. Labeling should include at least the computers name and its network (IP) address.

4.2 Pre-Test Activities

- 1) Identification of the test configuration was difficult.
 - Hardware diagrams were insufficient, especially the network diagrams.
 - Software installation (which programs at which version) on each platform was unknown.
 - There was no definitive source of system configuration information.

- 2) Insufficient documentation was received from CSCI and HWCI developers. This was not unexpected due to the Juno workload and schedule constraints the developers had in the Juno time frame. Specifically, the following types of documentation will be required in future CLCS deliveries:
 - Operating procedures .
 - Users' guides.
 - CSCI/HWCI test histories and test procedures.
 - A Requirements Verification Matrix (for each delivery) which maps functional level test cases to functional level requirements as well as functional level requirements to System Level Specification requirements.
 - Known error conditions.
 - Operational dependencies such as:
 - System configuration requirements for CSCI's and HWCI's.
 - Data requirements.
 - Required interfaces.
- 3) Room access and scheduling was difficult in the LCC-X.
 - The LCC-X facility was not released to the system integration team on schedule. This did not impact testing.
 - Demos for users and non-CLCS people were scheduled in the LCC-X during system integration and testing. Though this did not impact the testing, it had the potential to do so.
 - Again, not all personnel knew about the system configuration freeze.

4.3 Test Process

- 1) The system configuration freeze that was to take effect at the start of system integration was not observed.
 - People didn't know the system configuration was frozen.
 - They didn't understand how much of the configuration was frozen.
 - Changes were made to both hardware and software when they shouldn't have been.
- 2) Clarity of the System Test procedures could be improved.
 - Better identification of the location of steps in a procedure when equipment used in a test case is in multiple locations (for example, test case 3.3 where the LCC-X workstations are on the third floor of the LCC and the SDS gateway is on the second floor).

Appendix A - Acronyms and Definitions

AT	Acceptance Test - Test to accept hardware and software from a vendor
Certification	Final approval to use a system for a specified set of operations (e.g., hazardous operations in the HMF, launch operations, etc.)
CI	Configuration Item
CIT	CSCI Integration Test
CLCS	Checkout and Launch Control System
CM	Configuration Management
COTS	Commercial Off The Shelf
CSC	Computer Software Component
CSCI	Computer Software Configuration Item
DAR	Delivery Acceptance Review
EDL	Engineering Development Laboratory
GSE	Ground Support Equipment
HCI	Human Computer Interface
HMF	Hypergol Maintenance Facility
HW	Hardware
HWCI	Hardware Configuration Item
IDE	Integrated Development Environment
I/F	Interface
KSC	Kennedy Space Center
LAN	Local Area Network
LCC	Launch Control Complex
LMSMS	Lockheed Martin Space Mission Systems and Services
LPS	Launch Processing System
NASA	National Aeronautics and Space Administration
MSC	Mission Systems Contract (held by LMSMS)
OS	Operating System
PTR	Post-Test Review
PR	Problem Report

QA	Quality Assurance
QE	Quality Engineering
QT	Qualification Test
RLV	Reusable Launch Vehicle
RTPS	Real Time Processing System
RVM	Requirements Verification Matrix
SDC	Shuttle Data Center
SDE	Satellite Development Environment
SEMP	System Engineering Management Plan
SFOC	Space Flight Operations Contract (held by USA)
ST	System Test
SLWT	Super Light Weight Tank
S&MA	Safety and Mission Assurance (includes Reliability, Maintainability, Safety and Quality Assurance)
STS	Space Transportation System
SW	Software
TC	Test Conductor
TPR	Test Progress Review
TR	Test Report
TRR	Test Readiness Review
UAT	User Acceptance Test - Test performed by user community post delivery as part of the system certification process
UIT	Unit Integration Test
USA	United Space Alliance
UT	Unit Test
Validation	Testing performed by organization(s) outside of the developing organization to ensure that the delivered system processes data correctly and conforms to the operations concepts

Appendix B - Problem Reports

Issue Report

CSCI Name: MCC Services **Date:** 4/10/97
Criticality: Minor ☒ Major Critical
Platform: O2 **Location:** SDE-1
Baseline: sgi.d.jn.01.02
Originator: Robert Sutton
Phone #: 861-2218 **Pager #:** 680-3488
Title: POS_LOGIN: PSS environment variables not available in mwm xterms

Description:

The platform system services global environment variables are not sourced each time a xterm is started from Motif Window Manager (mwm).

CM USE ONLY

Issue Number: Juno-01
Date Entered: 4/10/97
Phase: Open Review ☒ In Work Closed
Resolution:

Issue Report

CSCI Name: MCC Services **Date:** 4/10/97
Criticality: Minor ☒ Major ☐ Critical
Platform: O2 **Location:** SDE-1
Baseline: sgi.d.jn.01.02
Originator: Robert Sutton
Phone #: 861-2218 **Pager #:** 680-3488
Title: Event Services: LDS Status/Control not available on remote workstations

Description:

Log/Delogg Status/Control remote node not available when attempting to perform Log/Status and Control of a remote workstation. Delogg information shows the following error message:
“get event: problem with es_receive errno=35. No error message of desired type in ES/ES Queue”

CM USE ONLY

Issue Number: Juno-02
Date Entered: 4/10/97
Phase: Open ☐ Review ☒ In Work ☐ Closed
Resolution:

Issue Report

CSCI Name: MCC Services **Date:** 4/10/97

Criticality: Minor ☒ Major ☐ Critical

Platform: O2 **Location:** SDE-1

Baseline: sgi.d.jn.01.02

Originator: Robert Sutton

Phone #: 861-2218 **Pager #:** 680-3488

Title: Timing Services: Core dump on Modify Timer

Description:

When attempting to modify an existing timer, a core dump occurs.

CM USE ONLY

Issue Number: Juno-03

Date Entered: 4/10/97

Phase: Open ☐ Review ☒ In Work ☐ Closed

Resolution:

Issue Report

CSCI Name: MCC Services **Date:** 4/10/97

Criticality: Minor ☒ Major ☐ Critical

Platform: O2 **Location:** SDE-1

Baseline: sgi.d.jn.01.02

Originator: Robert Sutton

Phone #: 861-2218 **Pager #:** 680-3488

Title: Timing Services: Cannot copy an existing timer

Description:

When attempting to copy an existing timer, the copy graphical User Interface does not get spawned.

CM USE ONLY

Issue Number: Juno-04

Date Entered: 4/10/97

Phase: Open ☐ Review ☒ In Work ☐ Closed

Resolution:

Issue Report

CSCI Name: MCC Services **Date:** 4/10/97

Criticality: Minor ☒ Major ☐ Critical

Platform: O2 **Location:** SDE-1

Baseline: sgi.d.jn.01.02

Originator: Robert Sutton

Phone #: 861-2218 **Pager #:** 680-3488

Title: Autopilot: Deconfigure doesn't work on logout

Description:

Deconfigure not performed on logout: hangs up on command: "Waiting on autopilot to deregister its processes".

CM USE ONLY

Issue Number: Juno-05

Date Entered: 4/10/97

Phase: Open ☐ Review ☒ In Work ☐ Closed

Resolution:

Issue Report

CSCI Name: MCC Services **Date:** 4/10/97

Criticality: Minor Major Critical

Platform: O2 **Location:** SDE-1

Baseline: sgi.d.jn.01.02

Originator: Robert Sutton

Phone #: 861-2218 **Pager #:** 680-3488

Title: Log/Delog: Font problem after application ID is added

Description:

The Delog GUI window changes size after application ID is added.

CM USE ONLY

Issue Number: Juno-06

Date Entered: 4/10/97

Phase: Open Review In Work Closed

Resolution:

Issue Report

CSCI Name: MCC Services **Date:** 4/10/97
Criticality: Minor ☒ Major ☐ Critical
Platform: O2 **Location:** SDE-1
Baseline: sgi.d.jn.01.02
Originator: Robert Sutton
Phone #: 861-2218 **Pager #:** 680-3488
Title: Printer Services: Cannot print man pages

Description:

From Printer Services user interface, man pages cannot be printed:

/usr/bin/man: ERROR: Illegal option --P

CM USE ONLY

Issue Number: Juno-07
Date Entered: 4/10/97
Phase: Open ☐ Review ☒ In Work ☐ Closed
Resolution:

Issue Report

CSCI Name: Operating System **Date:** 4/10/97
Criticality: Minor ☒ Major Critical
Platform: O2 **Location:** SDE-1
Baseline: O2 IRIX 6.3 970318
Originator: David Harrington
Phone #: 861-2219 **Pager #:** 680-3487
Title: Cannot run Configuration Management Shell application

Description:

Cannot find CVS executable in /usr/local/bin to run CM shell procedure

CM USE ONLY

Issue Number: Juno-08
Date Entered: 4/10/97
Phase: Open Review In Work ☒ Closed 4/10/97
Resolution:

CVS capability added by OS group and included on future OS downloads.

Issue Report

CSCI Name: Operating System **Date:** 4/10/97

Criticality: Minor Major Critical

Platform: O2 **Location:** SDE-1

Baseline: O2 IRIX 6.3 970318

Originator: David Harrington

Phone #: 861-2219 **Pager #:** 680-3487

Title: Positional .xsession sourced on login

Description:

The positional .xsession file is being sourced during the login process. This file should not be sourced until ops_cm does it during the configure process.

CM USE ONLY

Issue Number: Juno-09

Date Entered: 4/10/97

Phase: Open Review In Work Closed 4/10/97

Resolution:

POS_LOGIN script modified

Issue Report

CSCI Name: Reliable Messaging **Date:** 4/10/97
Criticality: Minor ☒ Major Critical
Platform: Challenge **Location:** SDE-1
Baseline: ch.d.jn.01.01
Originator: David Harrington
Phone #: 861-2219 **Pager #:** 680-3487
Title: DDP router process requires ROOT access

Description:

Receive error message “error opening msg queue: Permission denied” when attempting to start DDP router process. Attempted to use other ID’s (demo, lor_cma) with same result.

CM USE ONLY

Issue Number: Juno-10
Date Entered: 4/14/97
Phase: Open Review In Work ☒ Closed
Resolution: Permissions for the message queue file in ddp_router/Exec directory was modified to allow write access to other (777).

Issue Report

CSCI Name: Operating System **Date:** 4/14/97
Criticality: Minor ☒ Major Critical
Platform: O2 **Location:** SDE-1
Baseline: O2 IRIX 6.3 970318
Originator: David Reinhardt
Phone #: 861-2217 **Pager #:** 680-4259
Title: Telnet from sde1hci1 to sde1ddp-r failed

Description:

While executing Juno System Test: Testcase 3.4, telnet from sde1hci1 to sde1ddp1-r failed.

This prevented all testing of the ethernet to atm networking functions

CM USE ONLY

Issue Number: Juno-11
Date Entered: 4/14/97
Phase: ☒ Open ☐ Review ☐ In Work ☐ Closed
Resolution:

Issue Report

CSCI Name: MCC Services **Date:** 4/15/97
Criticality: Minor ☒ Major ☐ Critical
Platform: O2 **Location:** SDE-1
Baseline: sgi.d.jn.01.02
Originator: Robert Sutton
Phone #: 861-2218 **Pager #:** 680-3488
Title: Remote delog written into wrong directory

Description:

Remote configuration performed on workstation sde1hci3 from workstation sde1hci1. A remote delog was performed on sde1hci3. The delog file was not found in any user's home directory. The delog was found in directory /clcs/boot/cmttools/Exec. Delogs should not be written into this directory.

CM USE ONLY

Issue Number: Juno-12
Date Entered: 4/15/97
Phase: ☒ Open ☐ Review ☐ In Work ☐ Closed
Resolution:

Issue Report

CSCI Name: User Applications **Date:** 4/15/97

Criticality: Minor Major Critical

Platform: O2 **Location:** SDE-1

Baseline: ind.d.jn.01.01

Originator: Robert Sutton

Phone #: 861-2218 **Pager #:** 680-3488

Title: Application displays CPU intensive

Description:

Brought up application displays (wind direction, temperature) on indigo workstation. The gr_osview GUI shows that the displays are very CPU intensive.

CM USE ONLY

Issue Number: Juno-13

Date Entered: 4/15/97

Phase: Open Review In Work Closed

Resolution:

Issue Report

CSCI Name: Operating System **Date:** 4/22/97
Criticality: ☒ Minor ☐ Major ☐ Critical
Platform: Sun Ultra **Location:** LCC-2R24
Baseline: SDS GW (lccsdsg1)
Originator: David Reinhardt
Phone #: 861-2217 **Pager #:** 680-4259
Title: Telnet to SDS Gateway not working

Description:

While shutting down the SDS gateway (lccsdsg1), keyboard commands (via the telnet session from "atlantis") were not accepted. Another xterm was opened and the telnet operation worked without anomalies.

CM USE ONLY

Issue Number: Juno-14
Date Entered: 4/23/97
Phase: ☒ Open ☐ Review ☐ In Work ☐ Closed
Resolution:

Issue Report

CSCI Name: Operating System **Date:** 4/22/97
Criticality: Minor ☒ Major Critical
Platform: Indigo 2 **Location:** LCC-X
Baseline:
Originator: David Reinhardt
Phone #: 861-2217 **Pager #:** 680-4259
Title: Error received when attempting to start receive process

Description:

While attempting to start the receive process: **fd_hci_recv -rm JUNO_DDP_8**
the error “**clm_open (rvc_sock): open of IP Multicast failed**” was received.

CM USE ONLY

Issue Number: Juno-15
Date Entered: 4/23/97
Phase: ☒ Open Review In Work Closed
Resolution:

Appendix C - CLCS System Test Procedures (as run)